

# APPENDIX A- Heparanase Sequence Homology Data

|         |             |           |            |            |                 |                 |
|---------|-------------|-----------|------------|------------|-----------------|-----------------|
|         | 10          | 20        | 30         | 40         | 50              | 60              |
| mouse   | -MLR-----   | LLLLWLWG  | PGLGAL     | AQAGTAPT   | DDVDLEFYTKRPLRS | VSPSFLSIT       |
| rat     | -MLRP-----  | LLLLWLWGR | LALQTG     | TAPTKD     | VVDLEFYTKR      | LFQSVSPSFLSIT   |
| human   | MLLRSKPALPP | MLMLLLG   | PGLPLSP    | GALPRPAQAQ | DDVDLDF         | TQEPHLVSPSFLSVT |
| chicken | -----       | MLVLLLVLL | LAVPP----- | RR-TAELQ   | LGLREPI         | GAVSPAFLSLT     |
|         |             | *:*       | *          | ..         | ..:*            | :*:*:*:         |
|         | 70          | 80        | 90         | 100        | 110             | 120             |
| mouse   | IDASLATDP   | PRFLTFLG  | SPRLRAL    | ARGLSPAY   | LRFGGKT         | DFLIFDP         |
| rat     | IDASLATDP   | PRFLTFLG  | SPRLRAL    | ARGLSPAY   | LRFGGKT         | DFLIFDP         |
| human   | IDANLATDP   | PRFLILLG  | SPKLR      | TLAGLSPAY  | LRFGGKT         | DFLIFDP         |
| chicken | LDASLARD    | PRFVALLR  | HPKLT      | TLASGLSP   | GFLRFGG         | TSTDFLI         |
|         | :**         | **        | :*         | :*:*:*:    | :*:*:*:         | :*:*:*:         |
|         | 130         | 140       | 150        | 160        | 170             | 180             |
| mouse   | QVNHDIR     | SEPVSAAV  | LRKLQ      | VEWPFQ     | ELLREQY         | QKEFKN          |
| rat     | QDNDICG     | SERVSAD   | VLRLQ      | MEWPFQ     | ELLREQY         | QKEFKN          |
| human   | QVNQDICK    | YGSIPPD   | VEEKL      | RLEWPYQ    | EQLLREHY        | QKFKN           |
| chicken | QAK-DVCE    | AWPSFAV   | VPKLLT     | QWPLQ      | EKLLAEHS        | WKKHKN          |
|         | *:*         | *         | *          | :*:*       | :*:*            | :*:*            |
|         | 190         | 200       | 210        | 220        | 230             | 240             |
| mouse   | GLDLIFGL    | NALLRTP   | DLRWNSS    | NAQLLDY    | CSSKGYN         | ISWELGNE        |
| rat     | RLDLIFGL    | NALLRTP   | DLRWNSS    | NAQLLDY    | CSSKGYN         | ISWELGNE        |
| human   | GLDLIFGL    | NALLRTP   | DLRWNSS    | NAQLLDY    | CSSKGYN         | ISWELGNE        |
| chicken | GFRVFLGL    | NALLRR    | AGLQWD     | SSNAQLL    | GYCAQRS         | YNISWELG        |
|         | :*          | :*:*:*:   | :*:*:      | :*:*:      | :*:*:           | :*:*:           |
|         | 250         | 260       | 270        | 280        | 290             | 300             |
| mouse   | QLGEDFV     | ELHKL     | LQRS-AF    | QNAKLYG    | PDIGQ           | PRGKT           |
| rat     | QLGEDFV     | ELHKL     | LQKS-AF    | QNAKLYG    | PDIGQ           | PRGKT           |
| human   | QLGEDYI     | QLHKL     | LKRS-TF    | KNAKLYG    | PDVGC           | PRKTA           |
| chicken | QLGRDFV     | HLRQL     | LSQHPLY    | RHAEL      | YGLDVGC         | PRKHT           |
|         | :*:*:       | :*:*:     | :*:*:      | :*:*:      | :*:*:           | :*:*:           |
|         | 310         | 320       | 330        | 340        | 350             | 360             |
| mouse   | LNGRIATK    | EDFLSSD   | ALDTFIL    | SVQKIL     | KVTKEIT         | PGKKVWL         |
| rat     | LNGRVATK    | EDFLSSD   | VLDTFIL    | SVQKIL     | KVTKEIT         | PGKKVWL         |
| human   | LNGRTATR    | EDFLNP    | DVLDIF     | ISSVQK     | VFQVVE          | STRPGKK         |
| chicken | VNGRSATR    | EDFLSP    | EVLDSF     | ATAIH      | DVLGIVE         | ATVPGKK         |
|         | :*:*        | :*:*:     | :*:*:      | :*:*:      | :*:*:           | :*:*:           |
|         | 370         | 380       | 390        | 400        | 410             | 420             |
| mouse   | AAGFMWLD    | KLGLSA    | QMGI       | EVVMRQ     | VFFGAG          | NYHLVD          |
| rat     | AAGFMWLD    | KLGLSA    | QMGIE      | VVMRQV     | FFGAGN          | YHLVD           |
| human   | AAGFMWLD    | KLGLSAR   | MGI        | EVVMRQ     | VFFGAG          | NYHLVD          |
| chicken | VAGFMWLD    | KLGLAAR   | GIDV       | VMRQVS     | FGAGSY          | HLVDAG          |
|         | :*:*:       | :*:*:     | :*:*:      | :*:*:      | :*:*:           | :*:*:           |
|         | 430         | 440       | 450        | 460        | 470             | 480             |
| mouse   | LSRVKGP     | DRSKLRV   | YLHCTN     | VYHPRY     | QEGDLT          | LYVLNL          |
| rat     | MSRVKGP     | DRSKLRV   | YLHCTN     | VYHPRY     | REGDLT          | LYVLNL          |
| human   | MASVQGS     | KRRKLRV   | YLHCTN     | TNDNPRY    | KEGDLT          | LYAINL          |
| chicken | QASVEQ      | ADARRPRV  | YLHCTN     | PRHPKY     | REGDVT          | LFALNLS         |
|         | :*          | :*        | :*:*:      | :*:*:      | :*:*:           | :*:*:           |
|         | 490         | 500       | 510        | 520        | 530             | 540             |
| mouse   | LKPSGPD     | GLLSKS    | VQLNGQ     | ILKMV      | DEQTL           | PALTEK          |
| rat     | LKPFSGD     | GLLSKS    | VQLNGQ     | ILKMV      | DEQTL           | PALTEK          |
| human   | LRPLGPH     | GLLSKS    | VQLNGL     | TLKMV      | DDQTL           | PPLMEK          |
| chicken | LLPHGKD     | SILSREV   | QLNGRL     | LQMV       | DDQTL           | PALHEM          |
|         | :*:*        | :*:*:     | :*:*:      | :*:*:      | :*:*:           | :*:*:           |
| mouse   | AACI        |           |            |            |                 |                 |
| rat     | AACI        |           |            |            |                 |                 |
| human   | AACI        |           |            |            |                 |                 |

chicken      IACI  
             \*\*\*

Multiple alignment of heparanase from Human, Rat, Mouse and chicken generated by Clustal W. Active site residues are bolded and putative heparin binding sites are boxed.